2018

How Flipped Classrooms Impact K-12 Student Achievement: Flipping a Middle School Geography Classroom

Jenna Norman
Bethel University

HOW FLIPPED CLASSROOMS IMPACT K-12 STUDENT ACHIEVEMENT: FLIPPING A MIDDLE SCHOOL GEOGRAPHY CLASSROOM

A MASTERS THESIS

SUBMITTED TO THE FACULTY OF BETHEL UNIVERSITY

BY

JENNA M NORMAN

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

MASTERS OF TEACHING

NOVEMBER 2018

BETHEL UNIVERSITY

HOW FLIPPED CLASSROOMS IMPACT K-12 STUDENT ACHIEVEMENT: FLIPPING A MIDDLE SCHOOL GEOGRAPHY CLASSROOM

Jenna M. Norman

November 2018

Advisor: Molly J. Wickam, Ph.D.

Program Director: Molly J. Wickam, Ph.D.

Acknowledgements

First and foremost, I need to thank my loving and supportive husband Travis. Without him this research would not have been possible. Travis has stood by my side through various careers and graduate school programs, always supporting my decisions as I struggled to discover my calling in life. While pursing my Masters in Teaching from Bethel University Travis worked overtime to support our growing family, brought home countless cups of coffee and stepped up to care for our three children whenever I needed help. Travis, from the bottom of my heart, thank you. You are, and always have been, my biggest supporter and I couldn't do any of this without you. Secondly, I need to thank my parents. No matter what path I have chosen you have been there to support me and love be unconditionally. Thank you for always encouraging me to reach for my dreams and pushing me forward when I came up short. Finally, thank you to my advisor Dr. Molly Wickam. Your guidance, words of wisdom and unwavering support kept me going even when I wanted to quit. Without you this research would not be half of what it is.

Abstract

The purpose of this thesis is to apply knowledge gained from reviewing the literature on flipped classrooms to a middle school geography unit. The history of the flipped classroom model, varying models of flipped classrooms, the need for flipped classrooms and the importance of flipped learning are introduced to support the rationale and purpose of the research. Literature on academic performance, student achievement, instructor impact, and technology are reviewed to give benefits and challenges to flipping a middle school geography unit. An application emphasis is included to further discuss the audience, sustainability and resources required to flip a middle school geography unit. Limitations of the research are noted along with implications for future research.

Table of Contents

CHAPTER I: INTRODUCTION

Hands down, one of my favorite parts of the day, working as a 7th grade U.S. studies teacher, is standing in the hall before and after school and between classes, watching and listening to my middle school students talk and interact with one another. You cannot imagine the number of stories I could share about what transpires on a given day; middle schoolers are pretty awesome. It's especially rewarding when I get the chance to hear students getting excited about what they're learning and doing in the classroom.

Each year I strive to excite students in regards to what's happening in my social studies classroom. My favorite day of the school year, which just so happens to end up being a lot of my students' favorite day, is what my colleagues and I refer to as Trench Day. Leading up to this lesson, students spend several days evaluating the details of World War I; who was involved, why it began, how the United States became involved, and outcomes of the war. The day prior to Trench Day, students participate in a station activity where they rotate around the classroom to learn about different technologies introduced during WWI. Included is a station on trench warfare, no-mans-land, one detailing types of poison gas, and one explaining artillery and tanks. After working through each station, students are instructed to cut out and create their own gas masks that they will bring the following day to participate in our activity. On Trench Day students walk into a classroom transformed into the trenches of WWI. Complete with upturned desks, a fake no-mans-land with pretend barbed wire, and two distinct trenches, students are instantly intrigued. Students must pick a side and settle into their desks. As students work on study guides for their upcoming exam I play different sounds over the speakers, one sound representing a gas attack and another representing incoming artillery. Students are instructed

to react differently to each distinct sound. If they hear the gas attack sound they have three seconds to place their gas masks on, if they hear the artillery sound they have three seconds to dive into the trenches. If students do not react in time they are told they have died and receive an extra piece of homework for the evening. After students leave my classroom on Trench Day, and the weeks after, there is so much excitement in the hallways. Students compare their gas masks, reenact what happened in class, and share their war stories. I've even had students come back to me the following year to share they still have their mask! Not only do students truly enjoy what they're doing in class that day but they remember the content. When I grade my students' tests from our WWI unit, the majority get questions regarding WWI technologies and trench warfare correct and overall, I've noticed higher scores on the WWI test as a whole than on other exams.

Unfortunately, I don't have time to incorporate interactive lessons like Trench Day in each and every unit I instruct. The fact is, an additional year is added to history before we begin each new school year without adding more time to teach it all. This is why I am interested in flipping parts of my social studies classroom. If students can get the knowledge they need outside of class, then I can interact with them at school, and in turn provide experiences they will not only enjoy but that will lead to success.

History of Flipped Learning

The flipped classroom approach is defined in a variety of ways by varying researchers. Hamdan, P. McKnight, K. McKnight, and Arfstorm (2013) defined a flipped classroom as a model in which, "teachers shift direct learning out of the large group learning space and move it into the individual learning space, with the help of one of several technologies" (p. 4). Ozdamli and

Asiksoy (2016) go further and differentiate flipped learning from traditional learning by making the statement, “flipped classroom approach is not synonym with online videos, the important point is the interactive activities done during time when teacher and students are face to face” (p. 100). This chapter will evaluate the history of the flipped classroom, the four pillars of flipped learning, and different models of the flipped classroom.

Jonathon Bergmann and Aaron Sams are often regarded as the pioneers of the flipped classroom and first developed the concept in 2007 in rural Colorado. Both chemistry teachers, Bergmann and Sams were looking for a way that their students who often missed afternoon classes could keep up with course materials. They began by posting video recordings to YouTube in order for students to have access to content whenever and wherever it was convenient to them. As a result, they noticed that students became more engaged in the classroom and they were able to better individualize learning to students who needed it (Hamdan et al, 2013). What Bergmann and Sams discovered was that low-level tasks could easily be completed individually, without teacher facilitation, making room for enhanced higher-level tasks within the confines of the classroom, and with teacher assistance.

Hamdan et al. (2013) described the details of three empirical studies, each of which implemented flipped learning for various reasons. One of these studies was performed in Byron, Minnesota at Byron High School. The high school’s math scores were consistently low, with less than a third of students receiving passing scores on the state math test. In 2009 the entire math department switched to the flipped learning model in an attempt to increase learning without purchasing new textbooks. The teachers at Byron High School saw a significant change in their students. “By 2011, nearly three-quarters (73.8%) of students passed the state

math test, more than double the performance from just three years earlier, and the ACT composite scores improved to 24.5. Moreover, by 2012, 86.6% of Byron's seniors completed four our more credits of math" (p. 9). The other two studies detailed in the research from Hamdan et al. (2013); one from Woodland Park, Colorado, and the other from Clinton, Michigan, reported flipping classrooms for various other reasons. In Woodland Park, teachers chose to flip due to students missing too many classes while participating in extra-curricular activities, while in Michigan, the teachers felt the need to flip so they could better meet the needs of their low-income families and minorities. Both studies reported similar results as the study in Minnesota; an increase in student engagement and student achievement.

Need for Flipped Learning

Understanding the history of flipped learning helps to shed light on why teachers first began to feel the need for this model of education in their classrooms. As time has passed and more research has been evaluated, the need for implementing flipped classrooms across curriculums has increased. Student interests, habits, experiences, and worlds are ever-changing and if teachers wish to continue to reach their students they must adapt their instruction to meet these changes. One of the biggest adaptions teachers must make is the incorporation of technology. The P21 Framework for 21st Century Learning consists of student outcomes and support systems created by education experts and business executives. The framework includes skills relating to communication, one of which is to, "utilize multiple media and technologies" (P21 Partnership for 21st Century Learning. (n.d.). Framework for 21st century learning). The flipped classroom provides the opportunity for students to utilize technologies from various sources and to view these technologies through an educational lens. Cevikabhas and Argun

(2017) described what they refer to as the digital revolution and believed, “it will get increasingly difficult to educate the new generation through traditional methods, and that this will probably become impossible of the course of time” (p.190). As time changes, so must the way we teach.

Implementing the flipped classroom approach helps to bridge the gaps between curriculum related roadblocks and student achievement. Research supports that implementing flipped classrooms helps the instructor to move through content quicker which would be particularly helpful when teaching social studies curriculum. Erdogan and Akbaba (2017) described even more problems relating to social studies curriculum that require the use of flipped instructions, “individual differences, time inadequacy, inability to compensate students who missed the course, the inability to effectively implement an actively learning-based teaching process, and intensive theoretical knowledge transfer” (p.119). With a wide array of standards and the added impact of adding a year to history each year; without adding instructional time, social studies teachers are running out of time to complete all necessary coursework.

Primary sources are commonly used in the social studies classroom, notably in the geography classroom as students are expected to interpret and create their own maps. Snyder, Besozzi, Paska, and Oppenlander (2016) found that flipping the social studies classroom can be, “effective for studying primary sources and learning course content” (p. 30). Applying flipped classroom methods allows students to reach higher levels of learning and effectively apply and analyze both primary and secondary sources.

Importance of Flipped Learning

Cevikabhas and Argun (2017) linked flipped learning methods to Blooms taxonomy by sharing the importance cognitive tasks play in teaching and learning. They described the flipped classroom as having two distinct phases; the first phase prepares students for the second and is any out of class-work completed digitally, the second phase builds off the first and is any in-class inquiry-based work. They stated, “In general, low level cognitive tasks (remember, understanding) are performed as out-of-class flipped classroom practices while higher-level (application, analysis, evaluation, creation) cognitive activities are performed in classroom settings” (p. 193). If students can obtain basic knowledge, individually outside of class, teachers can cater instruction and create one-to-one opportunities during scheduled class-time to help students reach higher levels of thinking.

The concept of flipping classrooms has spread and educators continue to see more and more research on the challenges, benefits, and outcomes being performed each year. Hamdan and McKnight (2013) identified four pillars of flipped learning as the rules to flip. They believed this was important because, “just as no two traditional classrooms are identical, such is the case with flipped classrooms” (p. 5). These rules are identified as the four pillars of flipped learning and are, “Flexible Environment, Learning Culture, Intentional Content, and Professional Educator” (p. 5). A flexible environment is one in which students have options in regards to where they learn. A shift in learning culture is the shift from a classroom with the teacher as center to a classroom with the students at the center. Having intentional content means knowing as an educator what needs to be directly taught versus what students can explore on

their own. Professional educators are more important than ever as they must decide what content is shifted from traditional instruction to flipped instruction and must make the most of one-to-one time with students within the classroom (Hamdan and McKnight, 2013).

Models of Flipped Learning

Flipping a classroom doesn't always have to be in the traditional sense in which the student watches a video at home, answers short questions at the beginning of class, and then completes teacher facilitated activities during class time. According to Ozdamli and Asiksoy (2016) teachers can flip a classroom traditionally, partially or holistically. The partial flip is a less formal approach where students have the opportunity to watch videos outside of class but are not required to and are not punished for being unable to complete out of class work. This method is especially helpful in schools where not all students have access to internet and technology at home. The holistic approach adds three additional structures to the pillars of flipped learning: home, mobile and physical classrooms. In a holistic flipped classroom all learning spaces are monitored as students log in, complete tasks, and interact with their peers.

One model often used to integrate technology into the classroom is the Substitution Augmentation Modification Redefinition model or SAMR. Hamilton, Rosenberg, and Akcaoglu (2016) defined this model as a, "four-level, taxonomy-based approach for selecting, using, and evaluation technology in K-12 settings" (p. 433). Substitution is the level in which technology is simply substituted for another mode of learning, for example administering a test online instead of via paper and pencil. When augmentation is used technology is exchanged and the tasks students are to complete is enhanced; for example, rather than the teacher reading aloud, students listen using technology and read along. Modification requires a task to be

redesigned so that technology is at the forefront of the learning rather than the instructor, for example, a computer program demonstrating a skill instead of the instructor. Lastly, redefinition occurs when everyday tasks are completed using technology. For example, rather than writing an essay on a famous historical figure, students create videos on them (Hamilton, Rosenberg, and Akcaoglu, 2016).

Purpose and Guiding Questions

The purpose of this thesis is to apply knowledge gained from reviewing the literature on flipped classrooms to a middle school geography unit. Throughout this research four guiding questions were addressed: 1) How does flipping the middle school classroom impact student engagement and academic performance? 2) How does the implementation of flipped classroom impact the instructor? 3) What technology considerations need to be understood before flipping a middle school classroom? 4) What are the challenges and benefits to flipping a middle school classroom?

Definition of Terms

The following definitions are provided to assist in understanding of selected terms and research context as they appear throughout the paper.

Active Learning: A type of instruction defined by Cevikbas and Argun (2017) as a "process in which information and meaning is structured instead of relaying information" (p. 191).

Blended learning: This term is occasionally used to help describe the flipped learning process. Cevikbas (2017) describes blended learning as, "learning emerged from the combination of in-class face to face learning and online learning" (p.190).

Engaged Learning: Aycicek and Yapar Yelken (2017) researched engaged learning in flipped classrooms and use the definition, “active involvement of the student for learning activities” (p. 387) to describe engaged learning.

Flipped learning: There are a variety of definitions available to describe flipped learning. The definition largely used throughout this research comes from, Hamdan, P. McKnight, K. McKnight, and Arfstorm (2013) who defined a flipped classroom as a model in which, “teachers shift direct learning out of the large group learning space and move it into the individual learning space, with the help of one of several technologies” (p. 4).

Inverted classroom (IC): This is another term that is often used in place of flipped classroom or flipped learning. Baker, and Hill (2017) define the inverted classroom as one focused on, “incorporating, both traditional and e-learning pedagogical elements” (p. 17).

SAMR model: A technology-based education model, SAMR stands for substitution, augmentation, modification, and redefinition. Hamilton, Rosenberg, and Akcaoglu (2016) define this model as a, “four-level, taxonomy-based approach for selecting, using, and evaluation technology in K-12 settings” (p. 433).

TODALSS: An acronym commonly taught in social studies curriculum. TODALS is used to understand how to both read and create maps. It stands for Title, Orientation, Date, Author, Legend, Scale.

Traditional Classroom: The flipped classroom approach is often compared with the traditional approach. Hamdan, P. McKnight, K. McKnight, and Arfstorm (2013) cite King (1993) in their work and define the traditional method as one where, “the teacher is the main source

of information, the teacher is the “sage on the stage” (King, 1993), i.e. the sole content expert who provides information to students, generally via direct instruction lecture” (p. 5).

CHAPTER II: LITERATURE REVIEW

A variety of databases were utilized to locate and evaluate research for this thesis. Databases searched included, ERIC, Educator's Reference Complete, EBSCO MegaFILE, and Google Scholar. Publications were narrowed down to include; research performed in the years 2000 to 2018, research available in full text, and research that had been peer reviewed. Key words used while accessing research included, *flipped classroom benefits*, *flipped classroom challenges*, *flipped classroom engagement*, *flipped classroom relationships*, *professional development flipped classroom*, *flipped classroom technology*, and *flipped classroom academic performance*. This chapter serves to review the literature on flipped classrooms in four sections: Academic Performance, Student Engagement, Teacher Impact, and Technology.

Academic Performance

Utilizing a flipped classroom approach may have a direct effect on academic performance; specifically, student effort, student study habits, the ability of students to deeply understand material, and student resistance to change.

Student Effort

Implementing a flipped classroom changes the role of teacher and student, creating an environment where the teacher acts as facilitator and the student becomes the center of learning. This switch has a direct effect on the amount of effort required to be given by students. A study performed in Hawaii sought to identify relationships between student performance and effort in a flipped learning course (Winter, 2017). The setting for the study was a K-12 private school in Hawaii; participants included 35 sixth grade students ranging in age from 11 to 12 years. The research objective for this study was, "to determine the relationship

between students' motivation and learning performance measures in a middle school social studies classroom using flipped learning" (Winter, 2017, p. 179).

Findings showed that students who reported putting forth their best effort were more likely to have performed well. Participant responses to survey questions at the conclusion of the study supported the correlation between increased student effort and learning tasks assigned as part of the flipped classroom. Findings also supported the link between effort and performance as it pertains to the teacher-student relationship. The facilitator reported having more time to differentiate, meet with students face to face, and actively engage in the learning process while implementing the flipped learning model. The flexibility to meet the varying needs of students led to increased motivation, effort, and in-turn performance.

This study contained both strengths and limitations. A strength was that two data collection tools were utilized; one tool being student course grades and the second was a five-point Likert-type survey. Using two data collection tools allowed for evaluation of connections between actual participant performance and participant reported effort. One limitation was the small and specific sample size of 35, 6th grade students. This made it difficult to generalize the study to all classrooms. A second limitation was student access to technology. Ownership of a MacBook Pro or MacBook Air was a requirement to attend the private K-12 school where the study was performed. This requirement is not the case in the majority of schools thus, findings from this study cannot be generalized across all K-12 schools.

Student Study Habits

The change in student expectations outside of the classroom from a non-flipped to a flipped course has researchers wondering what happens to student study habits as a result.

Boevé et al (2017) conducted a study in the Netherlands that evaluated the study behavior of students participating in a non-flipped statistics course with the study behavior of students participating in a flipped statistics course. The two research questions from this study sought to investigate how students studied throughout the two courses, flipped versus non-flipped, and to what extent study behavior was linked to student performance. The sample included 205 pedagogical science major students, completing the flipped course and 295 students seeking a degree in psychology, completing the non-flipped course.

Initial results showed that students in the flipped course spent more time studying by reviewing lecture material; however, as the study progressed students in the non-flipped course spending more hours per week (on average) studying. Both students in the flipped course and the non-flipped course spent less time each week studying material in the weeks leading up to the final exam in comparison to the week immediately before the final exam. After a conclusive evaluation of the entire study it was found that there were no clear differences in how students' study between a flipped and non-flipped course.

A strength was the variety and amount of study behaviors evaluated. This study did not look solely at the number of hours spent studying but also at hours spent reading, doing homework, studying lecture slides, practicing, summarizing materials, and watching video lectures (for flipped participants only). By evaluating an array of behaviors, the results gave a comprehensive look at a variety of study behaviors across both groups. Limitations included the use of diaries, the burden on respondents, and the use of institutional course evaluations. Diaries used in research can come in many forms which makes it difficult to consider them a valid instrument. Completion of bi-weekly diaries places an extra burden on respondents and

may result in low participation amongst participants. Lastly the use of course evaluations is a limitation as they were anonymous and thus could not be linked to specific study behaviors (Boeve et al., 2017).

Deeper Understanding of Materials

Just as the flipped classroom can potentially impact study habits, there is evidence supporting a deeper understanding of course materials. For example, a study was undertaken in Taiwan with the intent of investigating two different teaching methods (flipped classroom and traditional classroom) and the effects on learning achievement (Sun & Wu, 2016). Two research questions were proposed; one investigating how learning achievement was impacted by each teaching method and the other exploring the impact each teaching method had on teacher-student interactions. The researchers used 181 student participants, all of which were freshmen students taking physics at a national university in Taiwan. Findings supported the hypothesis that learning achievement would be greater for students the experimental group who experienced the flipped classroom rather than the control group. Post-course scores for students participating in the flipped course method were significantly higher compared to scores of students participating in the traditional method.

Strengths and limitations are present in this study. Strengths include the ease with which the results can be evaluated. Students were given a pre-course achievement test at the start of the course and a post-course achievement test at the conclusion of the course. Scores on each test were compared between the experimental and control groups to find the statistical difference in scores for the experimental group. A limitation is that it did not utilize random assignment for participants. Students were allowed to choose their preferred teaching

method and as a result the flipped course initially contained 142 students while just 39 students registered for the traditional course. Researchers then switched the last 52 students who registered for the flipped class into the traditional class in order to ensure equal number of participants amongst courses. This switch may have caused participant bias in students that were forced to change.

Student Resistance

A change of methodology in the classroom can have a huge impact on students. Jaster (2017) performed a study in Texas to better understand the experiences of teachers and students in flipped classrooms by answering research question(s) in regards to students and teachers' perceptions of the flipped college algebra classroom. Twenty students participated while enrolled in a college algebra course at a community college in west Texas during the college's summer semester. The summer session college algebra course lasted just five weeks in comparison with the typical course lasting approximately 16 weeks during fall and spring semesters.

Data was collected using two instruments. Firstly, an essay assignment was given to collect data on student perceptions; secondly, an online survey was administered to gather additional information. Data analysis of the essays found that students reported that the flipped classroom required more work than a traditional classroom and resulted in less learning. In fact, some students were so unwilling and resistant to participate in the flipped classroom, enrollment decreased from 20 to 14 students by the end of the five-week term with just ten students continued to submit video questions through the entire term. It is important

to note that not all students were resistant to the change methodology and the teacher reported that many students initially embraced the flipped classroom approach.

Strengths include student anonymity and the use of qualitative and quantitative data. Students anonymously voiced their specific experiences and reflected on the application of a flipped classroom through essay and online survey. This information was then collected and analyzed according to emerging themes. Limitations include both researcher and participator bias. The researcher sought to remain neutral throughout the course of this study but it is possible that personal biases had an impact on reported perceptions. Participator bias may be a result of the fact that students were offered extra credit for their participation in the essays and online survey. Notably, three students did not participate in the essay or online survey and still received a grade of a B or higher for the course. Perhaps this is because these students did not feel they needed extra credit; however, based on their performance in the course, their responses to survey questions may have been somewhat more positive, impacting the reported student perceptions.

Student Engagement

Engagement by students in the classroom is impacted by implementing a flipped model approach. This section reports how peer-peer relationships, peer-teacher relationships, classroom behavior, and active/passive learning are all effected by utilizing a flipped classroom.

Peer-Peer Relationships

McCollum, Fleming, Plotnikoff, and Skagen (2017) conducted a research study in Canada in which evidence was found that using a flipped classroom approach helps to cultivate and enrich relationships amongst peers. The sample used consisted of three different sections of 60

students enrolled in a first-year general chemistry course at a public undergraduate commuter campus in Canada. In the study, two sections were taught using a traditional teaching method. These students attended weekly lectures and then completed assigned textbook readings and problems relating to lecture materials outside of class. The third section was taught using the flipped classroom method in which student's online homework assignments were broken into small chunks and assigned to be turned in prior to the corresponding lecture.

The original intent of this study was to "assess how ARCs and ORMA group quizzes would impact student reading habits and perceptions of the flipped classroom" (McCollum et al, 2017, p. 4), Academic Reading Circles (ARC) and Open-Response Multi-Attempt (ORMA) group quizzes. However, after thorough evaluation of research interviews the researchers noticed a strong relationships theme. Thus, the research study was written to further evaluate how relationships developed within a flipped classroom using a text-centric approach (the main focus being ARCs, ORMA, and in-class peer leaders).

The findings are largely qualitative and focused on interview responses from participants as evidence that a flipped classroom does establish strong peer-peer relationships. Many student participants found peer-peer relationships to be one of the largest benefits of the flipped classroom approach and spoke of the connection between the building of these relationships and their success in the course. For example, one student stated, "… the reading groups help me to interact with my peers. I also get different perspectives on ideas…" (McCollum et al, 2017, p. 6). Another student stated, "I felt like after group tests, people who were lagging behind learned a lot, and people who did understand, when they taught it they fortified what they understood…" (McCollum et al, 2017, p. 7). Midterm grades were evaluated

using Welch's *t*-test where a statistical difference was found between the flipped and non-flipped chemistry sections supporting the idea that relationships formed in the flipped class aided students struggling academically without hindering others.

It is important to note both strengths and limitations of this study. A strength is that multiple types of data were collected. Data collected consisted of mid-term exam scores as well as student surveys; where the evidence of peer-peer relationships corroborated with the mid-term exam scores. A limitation of this study is the lack of quantitative data. While the study does include a box-plot of mid-term exams, it heavily relies on participant surveys to support its findings.

Student-Teacher Relationships

Positive, trusting relationships between teachers and their students helps to form a comfortable environment in which all students have the ability to succeed. An exploratory study was undertaken in Minnesota with the purpose of evaluating the impact a flipped classroom has on student-teacher relationships, student academic performance, and student-student relationships (McCallum, Schultz, Sellke, and Spartz, 2015). The survey sample consisted of 71 undergraduate students at a university in Minnesota registered for two mathematics courses and one business course. Participants represented a variety of countries, majors, grade levels, and sexes. At the conclusion of each course, students were systematically assigned to one of six focus groups to ensure random selection. Participation in the focus groups interview and survey at the end of the study was relatively high with 60 of the 71 registered students participating.

Findings identified a positive relationship between student and teacher. Participants reported that the teacher had a better sense of each student's level of knowledge with one student stating, "It seems like our professor in our flipped class gets to know us better personally because she goes around, and she actually helps us" (p. 51). Participants also stated they viewed faculty as being more approachable and accessible when the flipped classroom method was utilized. Some participants stated, "I think the instructor has more time to help you since she's not focusing and giving a lecture to the whole class, she is walking around and you can ask questions and she will actually sit down and help you. Whereas, in the traditional classroom, you don't have time for that" (p. 52). Overall, results of the survey at the conclusion of the study found that students were satisfied with their experience in the flipped classroom; 85% of participants agreed that flipped the classroom helped their learning.

There are both strengths and limitations to this study. A strength was how students were assigned to focus groups. Systematic assignment was utilized to ensure the possibility a variety of ethnicities, genders, and grade levels were represented in each focus group. Focus groups were run by a third-party to eliminate the possibility of bias in reporting of participant responses. A limitation was the inability to generalize the results. Results came from just three undergraduate courses, over the course of one semester, with only 60 participants.

Classroom Behavior

Student engagement, specifically student behavior, is a growing field of interest as flipped classrooms become more widely used. Can flipped classrooms keep students better engaged in instruction thus improving their classroom behavior? Hodgson, Cunningham, McGee, Kinne, and Murphy (2017) performed a study in Kentucky with the purpose of

evaluating the differences in behavioral engagement between non-flipped and flipped classrooms. To answer the question of how engagement differs amongst settings, researchers used students and teachers as participants in three pre-college mathematics courses. Each course was assigned as a setting; the first setting consisted of 27 ninth grade Algebra 1 students, the second setting consisted of 24 eleventh and twelfth grade Algebra 2 students, and the third setting consisted of 26 seventh grade General Mathematics students.

Interestingly, the study did not find an overall increase in student engagement in non-flipped versus flipped classrooms. In settings one and two there was no statistical difference in engagement between the non-flipped and flipped classrooms. However, there was a statistical difference in the third setting consisting of 26 seventh grade general mathematic course participants. Findings indicate unique circumstances for both setting one and setting two. Student participants in setting one were highly engaged regardless of teaching method due to the practices of a highly effective and experienced teacher while students in setting two were generally not engaged in learning due to participation in a required course for which they had little interest in participating. Hodgson et al (2017) concluded that, “student engagement is not simply a function of instructional strategy (flipped versus non-flipped), but is a complex combination of instructional strategy, teacher abilities and actions, and student characteristics” (p. 257).

The study included a multitude of strengths, the first being diversity used in sampling. Student participants were used from both middle school and high school environments, and rural and urban communities, while teacher participants had varying levels of endorsements and experience. Teacher participants all attended the same five-day professional development

on flipped classrooms before creating their own materials designed to best fit the needs of their students. Another strength is how behavioral data was collected. Two observers, both trained to use the behavioral engagement observation instrument, were used in each classroom, observing the same lesson, and randomly selecting students for observation. A limitation of this study is that only three teachers were observed and all three teachers taught the same subject; mathematics. This makes it difficult to generalize the results to all populations, as well as other subject areas.

Active Versus Passive Learning

Acicek, and Yanpar Yelken (2017) developed a study in Turkey to determine how student engagement is affected when teachers switch to a flipped classroom model. The researchers sought to answer the question, “Is there a significant difference between classroom engagement levels of the students in the experimental group who is lectured with flipped classroom model and those in the control group whose course are carried out based on the current curriculum” (p 387-388). Experimental methods were used and participants included 40 seventh grade students who attended secondary school in the town of Hatay. Each class consisted of 20 students who were each randomly assigned to one of two groups, one as the control group and one as the experimental group. Students were given a Classroom Engagement Inventory as a pre-test at the beginning of the four-week study and a post-test at the conclusion allowing for a comparison in engagement from start to finish between the control and experimental groups. Evidence shows that when students are active in their learning, they may be able to more effectively retain information and thus experience higher levels of success.

The flipped classroom method used with the experimental group, required students to perform daily in-class activities and in turn receive immediate feedback from their teachers. This led students be more successful by using increasing levels of engagement. Acicek, and Yanpar Yelken (2017) state in their findings that, “the application of the flipped classroom model increase students’ classroom engagement level” (p. 392). The post test scores of student participants in the experimental group were significantly higher than that of the control group (which saw no difference in scores from pre to post-test). In the discussion of their study, Aycicek and Yapar Yelken (2017) attributed the statistically significant increase in post test scores among students in the experimental group to more active participation in class. Discussion of findings elaborated on the idea that the flipped classroom provided an active learning environment which increased student engagement.

A strength was the manner in which data was collected. The method, Classroom Engagement Inventory used a 5-point Likert scale to evaluate five sub-factors of behavior ranging from cognitive engagement to disengagement in the classroom. A limitation was the very small and specific sample size, as a total of just 40 participants were used, all of which were seventh graders from the same city. This makes it difficult to generalize the findings to larger populations across different environments.

Teacher Impact

Applying a new method of teaching such as the flipped classroom approach has an impact on teachers and their preparation time, curriculum development, and access to adequate training.

Teacher Preparation Time

Implementation of new teaching methods requires professional development centered around appropriate training for teachers before, during, and after they apply any new methods within their classroom. A study was undertaken in Hong Kong with the purpose of understanding barriers to implementing a flipped classroom (Wang, 2017). Participants were chosen using convenience sampling, selecting 210 in-service teachers from a variety of settings within Hong Kong. The research question aimed to discover what reported and perceived barriers are present when Hong Kong secondary teachers engage in a flipped classroom.

Participants began by completing a pre-intervention questionnaire, used to determine what barriers were present in implementing a flipped classroom; followed by interventions geared toward participant responses on the questionnaire and finally face-to-face interviews to self-report on interventions used. Findings of the pre-intervention questionnaire revealed both first-order (external) and second-order (internal) barriers. Teacher preparation time and technical training and support was a factor in teachers' attitudes against changing to a flipped classroom with 87% of teachers reporting they struggled with time before attempting to implement a flipped method of teaching. Post-intervention feedback demonstrated that with proper professional development and training, teachers gain confidence and 52% of participants reported they could use what they learned throughout training to adapt their teaching methods.

This study contained both strengths and limitations. Using qualitative methods to collect data is a strength in this case as it allowed for detailed information to be gathered via questionnaire in regards to why teachers were not implementing a flipped classroom. The use

of convenience sampling when gathering participants was a limitation. When convenience sampling is used it is difficult to target potential bias and generalize information to the overall population.

Curriculum Development

As with any new teaching method, development of new curriculum is vital to accurate implementation. Baker and Hill (2017) performed a study at the University of North Carolina – Wilmington focusing on how teachers work as stakeholders when executing a flipped classroom in an information systems (IS) and information technology setting. The sample used was drawn from an Introduction to Information Systems course over the span of three years; the first year consisted of 92 students participating in a lecture only course, the second year had 53 participants participating in a flipped classroom, the third year also used a flipped classroom model and had 52 participants. Baker and Hill (2017) used the term inverted classroom (IC) to answer the research question, "Does flipping the IS/IT classroom impact student evaluations of the teaching effectiveness of the instructor" (p. 18).

Findings determined that implementing a flipped classroom has a positive impact on student perceptions of their teacher. First year students experiencing the lecture only course responded positively 80% of the time in regards to teaching effectiveness while second year students experiencing the IC responded positively 100% of the time. The third group, also experiencing the IC reported a return to 80% of results being positive when discussing teaching effectiveness. Baker and Hill (2017) attribute this drop in positive responses to the fact that it will take multiple attempts for a teacher to perfect the implementation of the flipped classroom. In conclusion, Baker and Hill (2017) paraphrase from Morris (2013) and his study of

flipped classroom stating, “administrators needed to address the following roadblocks; culture change, time needed to implement the change; buy-in at the community and executive level; technology challenges; professional development needs and student perceptions” (p. 23).

A strength was the use of the same instructor over the three-year span in which the study took place. Using the same instructor ensured that any discrepancies amongst participant responses when asked about teacher effectiveness were due to the switch in teaching methods and not to a switch in teachers. One limitation of this study was the switch in instruments being used to collect data between year one and years two and three. A new instrument was initiated at the beginning of year two as it was able to consolidate teacher effectiveness measurements with course quality into single questions.

Adequate Training

Introduction of a new teaching method can seem daunting to teachers, especially those who have been in the profession for a longer period of time and may have seemed to perfect their craft using their own methods. Research is beginning to indicate that implementation of a flipped classroom requires specific training to ensure teacher competency and accurate application. A study was completed in Nevada with the purpose of identifying the benefits and challenges preservice teachers experienced while facilitating a flipped classroom (Graziano, 2016). Two of the research questions from this study were written to evaluate what specific challenges and/or benefits preservice teacher participants experienced while facilitating learning in a flipped classroom, and one was written to assess whether or not participants would flip their future classrooms. The sample used consisted of 24 preservice teachers, all of whom attended the same four-year university in the southwestern region of the United States.

All participants were enrolled in the same required course and were given the option to drop the course and switch to another section or take it at another time if they did not wish to participate in the study. None of the participants chose to switch sections or drop the course, none had previous taught or been taught in a flipped classroom setting, and all had limited teaching experience.

After four months, results were gathered using a post course survey, classroom observations, informal discussions with students, and student work samples. Results of the post course survey administered at the conclusion of the course revealed an abundance of challenges to flipping a course. Participants reported feeling uncomfortable with the amount of technology required to flip as well as being overwhelmed with the amount of work required to flip a lesson. Specifically, students felt that many teachers may not receive adequate technology training in a variety of software(s) to effectively flip. A suggested solution was to have schools offer an assortment of summer workshops with instructional technologists to train teachers to develop original content and utilize pre-existing content. Findings indicated that with proper training some but not all participants would consider flipping their future classrooms.

This study contained both strengths and limitations. A strength was the various methods used to acquire results. Researchers used four methods of data collection in order to get a comprehensive look at the experience each participant had both during and at the conclusion of the study. The post survey administered was anonymous while the classroom observation, informal interviews, and student work samples were not. A limitation was the small and specific sample size. The sample was drawn from a four-year university and contained only 24

participants, all of which attended the same university and had the same prior experiences with flipped classroom. This makes it difficult to generalize survey results to all populations.

Technology

Flipped classrooms requires access to technology both within the classroom and outside. Student access to technology, the ability to track student participation using technology, and technological roadblocks all have an impact on the execution of a flipped classroom.

Student Access to Technology

The implementation of a flipped classroom requires a high level of knowledge in regards to technology in the classroom by both students and teachers as well as effective use of that technology both at home and in school. A study was undertaken in Turkey using teacher candidates to better determine the usability of the flipped classroom in a social studies course (Erdogan and Akaba, 2018). This study sought to gather the opinions of nine social studies teaching candidates on the usability of a flipped classroom approach in a social studies classroom. The sample used included teaching candidates who were students at Kirkkale University in the Spring of 2017. The research was qualitative in nature and focused on the perceptions and experiences of nine social studies teacher candidates during the 2016-2017 academic year.

Findings were placed into eight different categories and organized into themes according to participant responses to an interview given at the conclusion of the study. Of the eight categories, four were relevant to student access to technology. The first category stated why there was a need for implementation of a flipped classroom in social studies, this being time for teachers to get through all required material each year. The third category seemed to

answer the problem of needing more time by allotting more time during class. Participants responded that implementing the flipped classroom model allowed for more time in class to do activities and to better reach students who might be struggling with the material. The fourth category discussed the disadvantages of using the flipped classroom. Participant feedback in this category indicated that "students might not fulfill their responsibility at home, the inequality of technological opportunity, the family reaction and the problem of inability to give immediate feedback" (p. 120). The biggest obstacle teaching candidates faced centered around the technology used to flip. Some students did not want to watch the videos at home so they didn't and many students didn't have the opportunity to watch the videos at home either due to lack of internet access or lack of technological devices at home. Teaching candidates also mentioned the obstacle of the instructor not being unable to provide immediate feedback while students participated in videos at home.

The study contained both strengths and limitations. A strength was how all nine participants were chosen to participate in this study. All nine had successfully completed the teaching methods course and had observed problems with teaching social studies during their internship. An additional strength of the study is reliability of the research. To ensure validity, a voice recorder was used during each participant interview, direct quotes from participants were used to support findings, and participants were given the opportunity to confirm data at the beginning of the content analysis stage. One limitation was the small and specific sample used. All nine participants attended the same University, at the same time, and had the same amount of teaching experience. All nine participants were also preservice. The study in no one way

contained feedback from teachers already in the field. This makes it difficult to generalize the findings to different populations across regions, subjects, and levels of experience.

Tracking Student Participation

The flipped classroom relies heavily on student participation in video lectures at home to ensure they are prepared to engage in in-class activities. An obstacle to flipping the classroom is tracking exactly what tasks students are completing outside the classroom. A study was undertaken in New York to better determine if flipping the social studies classroom increased student learning (Snyder, Besozzi, Paska, and Oppenlander, 2016). In the initial stages the study was split into two parts and reports on the action research of one social studies teacher referred to as Mr. Smith, using a traditional model of teaching as well as screencasting in his ninth-grade world history classroom. The final stage of the study drew a sample of students from a small suburban school district in New York individually assigned to participate in three class settings; firstly, a traditional classroom of 18 students, secondly a flipped classroom with non-interactive screencasts including 20 students and thirdly a flipped classroom of 19 students using embedded-question screencasts.

During part one of the study Mr. Smith gradually flipped his classroom by creating screencasts of his lectures and assigning them as homework to be completed alongside notes or a graphic organizer. In-class time was used for more activity-based learning. Results at the end of part one reported 85% of students feeling high levels of satisfaction with the learning module being utilized. During self-reporting students were very honest, some reporting that they did not watch the screencasts, rather they got notes from a friend or skipped through the screencast without listening to Mr. Smith but quickly gathering notes. This caused Mr. Smith to

revise his screencasts for part two of the study. Screencasts were modified to include embedded questions throughout that students were required to answer before they could move on in the video. Answers to these questions were recorded and entered into the gradebook. Results of part two of showed that students who completed the screencasts with embedded questions outperformed students who did not. Upon the conclusion of part two, Mr. Smith simultaneously taught three sections of world history; one taught as a traditional course, one flipped without interactive screencasting and one with flipped with embedded-question screencasts. Results found that students participating in the embedded-question screencast group outperformed the other two groups by only a small statistically insignificant margin ($p=.1724$). Data collected supported the use of embedded-question screencasting in the flipped classroom as it was beneficial to student engagement and caused students to better concentrate on their learning outside of the classroom which can equate to more purposeful learning during class hours.

Both strengths and limitations were present in the study. A strength is the use of both qualitative and quantitative data. The research sought to explore student results on pre and post-tests as well as student responses to a variety of survey questions. A limitation was that data used came from one teacher and one school. The school used was located within a suburban area where less than 10% of students qualified for free and reduced lunch. These statistics make it hard to generalize this study to differing populations in rural or more poverty-stricken areas.

Technological Roadblocks

Incorporating a new methodology with such a large focus on technology can be a difficult change, not just in mindset but in workability. While technology can be a huge asset with many advantages there are certain roadblocks worth noting. A study performed in California by Chen (2016) sought to investigate what issues arose while implementing a flipped classroom in ninth-grade health education. The sample came from an affluent public high school in northern California where all students had access to technology and internet access at home. Two sections of a ninth-grade health class were used; a section of 31 students participating in traditional classroom approach and a section of 33 students participating in a flipped classroom approach.

Results were reported using a mixed methods approach using student interviews, observations, and test scores. A MANOVA was used to run test results and while the article does not state the statistical results, no significant difference was found between the traditional and flipped classes. Observations of the 33 students in the flipped classroom demonstrated several students being unprepared for class time during the first few days. Student interviews provided an explanation of students being unprepared due to being resistant to the change in classroom format. Teacher interviews revealed a concern stemming from technological issues. Videos already produced were difficult to find and producing original content is very time consuming. After creation of new content or discovery of free sources technological issues arise; many teachers struggled with editing software and uploading videos while students may struggle downloading or playing videos at home. A suggestion at the

conclusion of this study was for teachers to create a website where all videos could be uploaded in advance.

The study contained both strengths and limitations. A strength was how the study was designed, using both quantitative and qualitative measures. Test scores were analyzed using MANOVA and reported no statistically significant difference between groups. Observations were performed a total of 12 times and recorded by both the teacher and researcher, compared and reported to ensure accuracy. A limitation was the sample that was used. All students in the study were from the same affluent public school and all had access to technology and internet access outside the classroom. This made it difficult to generalize this study to all populations.

Chapter III: Application of the Research

Application of a flipped unit requires a detailed evaluation of the purpose and rationale of flipping the unit, how the unit will change from traditional methods to flipped methods, who the audience is, what resources are required and how sustainable the unit will be once flipped. This chapter serves to review these topics in relation to flipping a middle school geography unit and helps to answer four guiding questions addressed throughout this research: 1) How does flipping the middle school classroom impact student engagement and performance? 2) How does the implementation of flipped classroom impact the instructor? 3) What technology considerations need to be understood before flipping a middle school classroom? 4) What are the challenges and benefits to flipping a middle school classroom?

Purpose and Rationale for the Flipped Unit

The purpose of the flipped geography unit was to reduce the length of time required to meet all academic standards. Research is beginning to indicate flipping classrooms for a variety of reasons. These reasons include: the desire to fit more curriculum into the same length of time, the need for more in-class time to focus on higher-order thinking and application, and catering content to students' interests. A twelve-day geography unit is proposed to be flipped to reduce the length to nine days of content. Flipping the unit would ultimately free up three full student contact days to be filled with additional curriculum. Social studies teachers often face the challenge of running out of time before completing all coursework. Erdogan and Akbaba (2017) questioned social studies teacher candidates in regards to why a flipped classroom model would be required in a social studies classroom. The candidates answered with much consistency, with all nine participants mentioning the need for more time. One

candidate remarked, “The length of the course time is rather short, so we cannot spare time for class activities” (p. 119). Flipping this geography unit would do just that; condense the time needed to complete all required coursework. In addition to freeing up time, it would allow for the integration of higher-order thinking and application activities. Sun & Wu (2016) performed a study in Taiwan with the intent of investigating two different teaching methods (flipped classroom and traditional classroom) and their effects on learning achievement. They found that students participating in the flipped classroom experienced higher levels of achievement than students participating in the traditional classroom.

The essential question used for this unit was, what is a map and how do you read it? This question was chosen in conjunction with Minnesota K-12 academic social studies standards. There is only one geography standard and benchmark assigned to 7th graders in a social studies classroom pertaining to what is a map and how do you read it. The standard states, “People use geographic representations and geospatial technologies to acquire, process and report information within a spatial context” (Minnesota Department of Education, 2013, p. 71) and the benchmark reads, “Create and use various kinds of maps, including overlaying thematic maps, of places in the United States; incorporate the ‘TODALSS’ map basics, as well as points, lines and colored areas to display spatial information” (Minnesota Department of Education, 2013, p. 71). These standards were used to create a unit in which students would have the opportunity to learn, practice, and apply knowledge in this context.

The flipped geography unit requires students to watch videos and complete readings outside of class on a number of occasions. These readings and videos included basic, introductory information in regards to map reading using TODALS, latitude and longitude, and

absolute and relative location. This information was previously taught in class and was followed by application that students took home as individual practice. By flipping the geography classroom, students would be able to gain this basic knowledge outside of class and in-turn use class time to practice and apply their new skills on a deeper level. Research is beginning to indicate that flipping the classroom impacts students' abilities to deeply understand materials. Sun & Wu (2016) found that, "the flipped classroom created a richer and more dynamic physical environment for internalizing the knowledge" (p. 92). The intent for flipping the geography classroom is to create an environment conducive to understanding material on a deeper level.

Flipping the geography classroom allows teachers to better connect curriculum to student interests and adapt to the changing paradigm of education. Teachers are also able to better meet new school technology requirements. Snyder et al (2016) found that one teacher flipped in order to, "better align his teaching with his school district's technology goals" (p. 34). The flipped geography unit proposes flipping a geography classroom in a 1:1 middle school where each student is issued an iPad and teachers are expected to incorporate technology into instruction. When flipping the geography classroom, the instructor is adapting their teaching style and classroom environment to meet the needs of a new generation of learners. Cevikabhas and Argun (2017) refer to students today as digital natives and teachers who are not flexible to meet the changing needs of students as digital immigrants. They believe this means we must rethink how we teach to meet how students and learn and state, "one of the possible ways to achieve this goal is reorganizing the teaching and learning environments" (p. 189). Flipping the middle school geography classroom for the flipped geography unit

restructures the roles of teacher and student, creating an environment in which students have a greater investment and interest in their education.

Unit Plan Changes

The original unit plan, shown in Appendix A, was rewritten using a flipped model. The new Unit Plan can also be found in Appendix A. The original plan took twelve school days from beginning to end. The typical daily lesson in the original plan consisted of in-class notes followed by practice with any practice left incomplete during the school day becoming homework. The flipped plan shortens the unit to nine days by replacing in class lecture with out of class videos and readings. A typical daily lesson when implementing the flipped model consists of a short review of material that was required as homework the night before followed by in-class practice with teacher assistance. The only homework assigned during the flipped unit is videos or short readings that introduce new topics important to understand for class the following day.

Changes made to adjust the unit from a traditional method to a flipped method were solely instructional with no existing content being edited or additional content being added. The materials used for the unit, including formative and summative assessments were not altered in anyway. Students participating in both the flipped and traditional methods completed the same amount of work, engaged in the same amount of practice and took the same final summative assessment. The order in which materials were presented to students also remained the same for the traditional and flipped units, with the only difference being the pace at which students progressed through materials while participating in the flipped unit.

Audience

This unit was created for 7th grade students at Maple Grove Middle School in Maple Grove, MN. Three other social studies teachers and I work collaboratively as part of a professional learning team (PLT) in which we lesson plan, goal set, and compare pre and post assessment data. Our team meets each Monday after school to plan curriculum and assessments aligned with Minnesota state standards and each member makes the commitment to administering the same summative evaluations to students in order to best compare data. Creating and implementing common curriculum including summative assessments, ensures that each student at Maple Grove Middle School is experiencing social studies content in a similar way; designed to engage, enrich, and enhance the learning experience while meeting state standards.

This flipped geography unit has ultimately been created to be used by all four teachers collaborating as part of the 7th grade United States studies professional learning team. The long-term plan for deployment of the flipped unit starts with implementation by just myself during year one. At the conclusion of year one data will be compared from my flipped unit against the traditional unit administered by the other three members of the PLT. If there is an increase in student achievement using pre and post assessment at the conclusion of year one the remaining team members should buy-in to the idea and complete grade-level implementation can follow. Data used to assess student achievement would include formative assessments based upon vocabulary, latitude and longitude practice, and absolute and relative location as well as summative assessment data from the end of unit exam.

Required Resources

A variety of resources will be necessary to properly implement the flipped geography unit. Required resources will include technology for student use such as: internet access, video creation by the PLT, curriculum development, and classroom materials. Maple Grove Middle School is already a 1:1 school where each student receives a district issued iPad during the first week of the school year to be used for educational purposes. This eliminates the need to purchase additional technology for student use. Not all students have access to internet at home; therefore, allocating school time to watch digital videos will ensure all students have the ability to succeed. Each CORE teacher (those who teach, social studies, English, science, and mathematics) will be assigned an advisory class in which they will need to schedule time each week for students to complete homework assignments including flipped classroom videos and resources using the school's internet connection.

Prior to the implementation of the flipped classroom, videos and curriculum will need to be created, tested, and posted for student use. Two to three curriculum writing days with district provided sub coverage is necessary to allow my PLT and me to find existing videos, create new videos/screen-cast-o-matics, and enrich our classroom activities. Altering our schedule to reflect the nine days of geography curriculum in lieu of the previous layout of 12 days is also time consuming and can be achieved during curriculum writing days. Upon completion and creation of new curriculum including videos/screen-cast-o-matics and class activities, our team will need to test these materials. Each teacher is equipped with a desktop computer run by Microsoft and an Apple iPad. It is important to note that these two software systems and devices don't always run the same programs and download content very

differently. All new curriculum will need to be carefully and thoroughly checked on each device, with each software system to ensure students do not experience technological roadblocks.

In addition to time to create video content, Maple Grove Middle School will need to expand its subscription to Edpuzzle, a service being used by the 7th grade mathematics teachers who currently flip their classrooms. Edpuzzle is a service where teachers either upload premade videos from websites such as YouTube or Khan Academy or create their own videos for students to watch. A unique characteristic to Edpuzzle is that teachers are able to track student participation through embedded questioning and tracking features where teachers can access student data in regards to what sections of each video have been viewed and how many times. Edpuzzle is compatible with the iOS Apple operating system and Chrome on Microsoft devices making it the ideal program for flipping geography at a school in which both systems are utilized.

In order to best implement new, engaging, higher level activities within the classroom teachers will need access to new materials including United States Atlases. In our current curriculum, myself, along with the three other members of my PLT, borrow U.S. Atlases from the eighth-grade teachers at our school. In order to best flip our geography unit, we will need access to our own class sets of atlases that students can check-out and take home for video support.

Sustainability

This project will be implemented in a way in which only minor edits will be required to sustain the project each year. Working as part of a PLT allows for content driven time each week to evaluate curriculum and update assessments as deemed necessary. PLT time can be

used to discuss student data on pre-assessment work, prior to the start of the unit, and post assessment work, at the conclusion of the unit. Data collected during this time will be used to support the need for resources, including the Edpuzzle subscription each year. The sustainability of the project relies heavily on the yearly school subscription to Edpuzzle as that application acts as the hub for all video content.

Once videos are created they can be used year after year due to the fact that geography content does not change. How we read a map, use latitude and longitude, and describe absolute and relative location is concrete information that will not need updating as time passes. There is one instance in which the curriculum for this unit would change and that would be when the state of Minnesota updates its social studies standards every ten years. Videos and curriculum will need to be evaluated at that time to ensure standards are being thoroughly met. The evaluation of geography content every ten years as state standards are revised is necessary in both the flipped classroom method and traditional method; therefore, this evaluation should not impede the sustainably of this program.

Creating video content using the Edpuzzle application keeps this project sustainable in the event that Maple Grove Middle School would switch from a school with 1:1 Apple devices utilizing the iOS system to Chromebooks utilizing Microsoft based systems. Edpuzzle can be used on either device with no edits required by the administrator. However, in order to store all data and materials, Maple Grove Middle School would still be required to consistently renew the Edpuzzle subscription each year.

CHAPTER IV: Discussion and Conclusion

Utilizing a flipped classroom design is a fairly new concept with much research still required. Bergmann and Sams (2007) are often regarded as the pioneers of the flipped classroom and first developed the concept in rural Colorado. Both chemistry teachers, Bergmann and Sams were looking for a way that their students, who often missed afternoon classes, could keep up with course materials. What Bergmann and Sams discovered was that low-level tasks could easily be completed individually, without teacher facilitation, making room for enhanced higher-level tasks within the confines of the classroom, and with teacher assistance (Hamdan et al, 2013). The need for flipped learning arises not solely due to students missing school but a variety of reasons. Student interests, habits, experiences, and worlds are ever-changing and if teachers wish to continue to reach their students they must adapt their instruction to meet these changes. One of the biggest adaption's teachers must make is the incorporation of technology. Cevikabhas and Argun (2017) described what they refer to as the digital revolution and believe, "it will get increasingly difficult to educate the new generation through traditional methods, and that this will probably become impossible of the course of time" (p.190). As time changes, so must methods of educational instruction.

The purpose of this research was to evaluate studies based on varying methods of flipped learning. Throughout this research four guiding questions were addressed: 1) How does flipping the middle school classroom impact student engagement and academic performance? 2) How does the implementation of flipped classroom impact the instructor? 3) What technology considerations need to be understood before flipping a middle school classroom? 4) What are the challenges and benefits to flipping a middle school classroom?

Research is beginning to indicate that utilizing a flipped classroom approach can direct effect on academic performance; specifically, student effort, student study habits, the ability of students to deeply understand material, and student resistance to change. Sun & Wu (2016) found that post-course scores for students participating in a flipped course were significantly higher compared to scores of students participating in a traditional classroom. Student effort also affects student performance; Winter (2017) found that students participating in a flipped classroom model put forth more effort than that of students in a traditional classroom. Winter's findings also supported the link between effort and performance as it pertains to the teacher-student relationship. The facilitator reported having more time to differentiate, meet with students face to face, and actively engage in the learning process while implementing the flipped learning model. The flexibility to meet the varying needs of students leads increased motivation, effort, and in turn performance.

Student engagement is also impacted by implementing a flipped classroom approach. Peer-peer relationships, peer-teacher relationships, classroom behavior, and active/passive learning are all affected by utilizing a flipped classroom. Aycicek and Yapar Yelken (2018) suggest that the flipped classroom can provide an active learning environment which increases student engagement and ultimately student success. Research is beginning to indicate that peer-peer relationships improve when using the flipped classroom approach (McCollum, Fleming, Plotnikoff, and Skagen, 2017). Utilizing a flipped classroom model also helps to cultivate a positive relationship between student and teacher, this may be due to a switch from passive learning in the traditional classroom to active learning in a flipped classroom (McCallum, Schultz, Sellke, and Spartz, 2015).

Applying a new method of teaching such as the flipped classroom approach has an impact on teachers and their preparation time, curriculum development, and access to adequate training. Identifying the benefits and challenges preservice teachers experienced while facilitating a flipped classroom revealed an abundance of challenges that teachers may encounter when flipping a course. Participants reported feeling uncomfortable with the amount of technology required to flip as well as being overwhelmed with the amount of work required to flip a lesson. Specifically, participants felt that many teachers may not receive adequate technology training in a variety of software(s) to effectively flip (Graziano, 2016).

Flipped classrooms require access to technology both within the classroom and outside the classroom. Student access to technology, the ability to track student participation using technology, and technological roadblocks all have an impact on the execution of a flipped classroom. The use of specific programs when implementing a flipped classroom can help to hold students accountable for their participation in activities outside of the classroom. Using screencasting with embedded questions requires students to answer content related questions while watching videos at home. Research is beginning to indicate that this give students ownership of what they are doing and holds them accountable for participating in required work which increases classroom engagement (Snyder, Besozzi, Paska, and Oppenlander, 2016).

Professional Application

Implementing a flipped classroom is a concept that originated in the United States but is being explored in countries all over the world. Research in this paper evaluated studies from Canada to China, Turkey to Taiwan and the Netherlands. As student learning shifts from traditional methods of lecture then test to modern methods that incorporate technology and

active learning students around the world are affected. Technological roadblocks were evaluated as part of the literature review; it's important to note that developed countries may have an advantage over developing countries when implementing a flipped classroom as access to internet is an important piece to flipping the classroom.

While evaluating research for this paper over 50% of studies performed on the flipped classroom model come from the United States with a total of two studies used in this thesis coming from the state of Minnesota. Implementation of the flipped classroom requires a variety of resources from technology to internet access to support from administration and adequate training. If countries/states/school district don't have these resources readily available to them or cannot gain access to them attempting to use the flipped classroom model will be extremely difficult.

Limitations of the Research

Utilizing a flipped classroom design is a new concept with much research still required. As research was conducted for this thesis it became extremely evident that additional research is required on flipped classrooms before concrete correlations can be concluded on the flipped method. Various databases were used throughout the research in an attempt to discover new, relevant studies that pertained to the guiding questions of this paper. However, even with extended research the amount of available studies were limited.

Research from secondary education, performed in the United States, was given priority over other studies, nevertheless studies conducted in University settings outside of the United States had to be included to ensure an adequate number of research studies. Throughout the research process there was an expectation that many studies from social studies classrooms

would be accessible and helpful in answering the guiding questions of this paper, that was not the case. The number of flipped classroom studies in social studies settings is very limited despite that there were a number of research studies addressing the fact the flipped classroom is ideal fit for social studies curriculum.

Additional research on the flipped method is needed as research is very limited. The research studies evaluated throughout this paper are mostly qualitative in nature and have not been replicated. Since the majority of the studies evaluated in this thesis are qualitative, they cannot be generalized to the larger population. In addition to the research being mostly qualitative many studies also reported a small sample size which also calls into the question the generalizability of the research. Replication of these studies will build a stronger research base and allow results to be triangulated.

Implications for Future Research

As research on the topic of flipped learning expands and develops it is important to begin to look at the impact this model has on students and families and teachers. Research needs to be conducted to establish whether the increase in screen time affects students both physically and mentally. Research on the increased use of screens for entertainment and education and its impact on children is just beginning thus it would be important to evaluate correlations between required screen time and physical and mental impacts on children today. Research should also be done to evaluate relationships between the flipped classroom model and family time. With so many students involved in out-of-school activities from sports to music to church, replacing additional homework time in the form of videos would likely impact the amount of time families have together during the week.

Conclusion

The purpose of this research was to evaluate the impact implementing a flipped classroom model has on student achievement. Moving from a traditional method of teaching to a flipped method is not a decision that should be made quickly and without proper evaluation. The history of the flipped classroom model, varying models of flipped classrooms, the need for flipped classrooms and the importance of flipped learning were assessed to support the purpose of this research. Literature on academic performance, student achievement, instructor impact, and technology were thoroughly reviewed in order to evaluate the benefits and challenges to flipping a middle school geography unit. Limitations to research were noted and included the need for further research within the social studies content and in middle school classrooms.

References

Ayçiçek, B., & Yanpar Yelken, T. (2018). The effect of flipped classroom model on students' classroom engagement in teaching english. *International Journal of Instruction*, *11*(2), 385–398. doi:10.12973/iji.2018.11226a

Baker, E. W., & Hill, S. (2017). Investigating student resistance and student perceptions of course quality and instructor performance in a flipped information systems classroom. *Information Systems Education Journal*, *15*(6), 17–26. Retrieved from http://ezproxy.bethel.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1151896&site=ehost-live&scope=site

Boevé, A. J., Meijer, R. R., Bosker, R. J., Vugteveen, J., Hoekstra, R., & Albers, C. J. (2017). Implementing the flipped classroom: An exploration of study behaviour and student performance. *Higher Education: The International Journal of Higher Education Research*, *74*(6), 1015–1032. doi:10.1007/s10734-016-0104-y

Çevikbas, M., & Argün, Z. (2017). An innovative learning model in digital age: Flipped classroom. *Journal of Education and Training Studies*, *5*(11), 189–200. doi:10.1114/jets.v5i11.2322

Chen, L.-L. (2016). Impacts of flipped classroom in high school health education. *Journal of Educational Technology Systems*, *44*(4), 411–420. doi:10.1177/0047239515626371

Erdogan, E., & Akbaba, B. (2018). Should we flip the social studies classrooms? The opinions of social studies teacher candidates on flipped classroom. *Journal of Education and Learning*, *7*(1), 116–124. doi: 10.5539/jel.v7n1p116

Graziano, K. J. (2017). Peer teaching in a flipped teacher education classroom. *TechTrends: Linking Research and Practice to Improve Learning*, *61*(2), 121–129. doi:10.1007/s11528-016-0077-9

Hamdan, N., & McKnight, P. (2013). A review of flipped learning. *Flipped Learning Network.* Retrieved from https://flippedlearning.org/wp-content/uploads/2016/07/LitReview_FlippedLearning.pdf

Hamilton, E. R., Rosenberg, J. M., & Akcaoglu, M. (2016). The substitution augmentation modification redefinition (SAMR) model: A critical review and suggestions for its use. *TechTrends: Linking Research and Practice to Improve Learning*, *60*(5), 433–441. doi:10.1007/s11528-016-0091-y

Hodgson, T. R., Cunningham, A., McGee, D., Kinne, L. J., & Murphy, T. J. (2017). Assessing behavioral engagement in flipped and non-flipped mathematics classrooms: Teacher abilities and other potential factors. *International Journal of Education in Mathematics, Science and Technology*, *5*(4), 248–261. doi:10.18404/ijemst.296538

Jaster, R. W. (2017). Student and instructor perceptions of a flipped college algebra classroom. *International Journal of Teaching and Learning in Higher Education*, *29*(1), 1–16. Retrieved from http://ezproxy.bethel.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1135836&site=ehost-live&scope=site

McCallum, S., Schultz, J., Sellke, K., & Spartz, J. (2015). An examination of the flipped classroom approach on college student academic involvement. *International Journal of Teaching and Learning in Higher Education*, *27*(1), 42–55. Retrieved from

http://ezproxy.bethel.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1069793&site=ehost-live&scope=site

McCollum, B. M., Fleming, C. L., Plotnikoff, K. M., & Skagen, D. N. (2017). Relationships in the flipped classroom. *Canadian Journal for the Scholarship of Teaching and Learning*, *8*(3). Retrieved from http://ezproxy.bethel.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1162998&site=ehost-live&scope=site

MN Department of Education. (2013) *Minnesota K-12 academic standards social studies 2011.* Retrieved from http://www.mcss.org/Resources/Documents/2011%20Social%20Studies%20Standards.pdf

Ozdamli, F., & Asiksoy, G. (2016). Flipped classroom approach. *World Journal on Educational Technology: Current Issues*, *8*(2), 98–105. Retrieved from http://ezproxy.bethel.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1141886&site=ehost-live&scope=site

P21 Partnership for 21st Century Learning. (n.d.). Framework for 21st century learning. Retrieved from http://www.p21.org/about-us/p21-framework/261

Snyder, C., Besozzi, D., Paska, L., & Oppenlander, J. (2016). Is flipping worth the fuss: A mixed methods case study of screencasting in the social studies classroom. *American Secondary Education*, *45*(1), 28–45. Retrieved from http://ezproxy.bethel.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1121107&site=ehost-live&scope=site

Sun, J. C.-Y., & Wu, Y.-T. (2016). Analysis of learning achievement and teacher-student interactions in flipped and traditional classrooms. *International Review of Research in Open and Distributed Learning*, *17*(1), 79–99. Retrieved from http://ezproxy.bethel.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1090880&site=ehost-live&scope=site

Wang, T. (2017). Overcoming barriers to "flip": Building teacher's capacity for the adoption of flipped classroom in Hong Kong secondary schools. *Research and Practice in Technology Enhanced Learning, 12:6.* doi: 10.1186/s41039-017-0047-7

Winter, J. W. (2018). Performance and motivation in a middle school flipped learning course. *TechTrends: Linking Research and Practice to Improve Learning*, *62*(2), 176–183. doi:10.1007/s11528-017-0228-7

Appendix A

Geography Unit – Traditional Classroom Model

Day 1 Learning Target: I can… define TODALS and find the elements on a map. 1. Pre-Test 2. TODALS PowerPoint <u>HOMEWORK:</u> TODALS Practice	Day 2 Learning Target: I can… read a compass. 1. Review TODALS Practice Homework 2. Compass Introduction and Practice <u>HOMEWORK:</u> Geography packet page 1 and pages 3-5	Day 3 Learning Target: I can… find major grid lines on a globe and use lines of latitude and longitude. 1. Review Homework 2. Special Grid Lines Video (page 2) 4. Grid Line Practice (page 6)	Day 4 Learning Target: I can… find major grid lines on a globe and use lines of latitude and longitude. 1. Review Grid Lines 2. Latitude and Longitude Reading (pages 7-8) 2. Latitude and Longitude Modeling/Practice (page 9)
Day 5 Learning Target: I can… find major grid lines on a globe and use lines of latitude and longitude. 1. Review Latitude and Longitude 2. Latitude and Longitude Atlas Practice (pages 10-11) <u>HOMEWORK:</u> Latitude and Longitude Practice (pages 10-11)	Day 6 Learning Target: I can… find major grid lines on a globe and use lines of latitude and longitude and tell the difference between major time zones. 1. Finish Latitude and Longitude 2. Time Zones Reading (page 12) 3. Time Zone Practice (page 13)	Day 7 Learning Target: I understand basic geography vocabulary and can use terms accurately in a sentence. 1. Vocabulary PowerPoint 2. Vocabulary Frayers <u>HOMEWORK:</u> Finish Vocabulary	Day 8 Learning Target: I can… use absolute and relative location to define landmarks. 1. Vocabulary Review Game 2. Absolute and Relative Location PowerPoint 3. Absolute and Relative Location Practice (pages 17-18) <u>HOMEWORK:</u> Absolute and Relative Location Practice (pages 18-19)

Day 9 Learning Target: I can… create a political map using TODALS. 1. Types of Maps PowerPoint 2.Continents and Oceans Practice (page 14-15) 2. Political Map Practice (page 16) <u>HOMEWORK:</u> Political Map	Day 10 Learning Target: I can… create a physical map using TODALS. 1. Finish Political Maps 2. Physical Map Practice (page 17) <u>HOMEWORK:</u> Physical Map	Day 11 1. Review Day * Finish Missing Work *Work on Study Guides * Class Review	Day 12 1. Geography Test

Geography Unit – Flipped Classroom Model

Day 1 Learning Target: I can… define TODALS and find the elements on a map. 1. Pre-Test 2. TODALS Practice and Review 3. Work on Vocabulary Frayers – FORMATIVE ASSESSMENT <u>HOMEWORK:</u> 1.Compass Rose Screen-cast-o-matic 1. Special Grid Lines Video (Complete page 2) 2. Packet pages 1-3	Day 2 Learning Target: I can… read a compass and find major grid lines on a globe 1. Review Packet pages 1-3 2. Compass/Grid Lines Practice (pages 4-6) <u>HOMEWORK:</u> 1. Latitude and Longitude Reading (pages 7-8)	Day 3 Learning Target: I can… Use lines of latitude and longitude. 1. Review Packet pages 7-8 2. Latitude and Longitude Practice (pages 9-10) <u>HOMEWORK:</u> Time Zones Reading (page 12)	Day 4 Learning Target: I can… tell the difference between major time zones. 1. Review Time Zones (page 12) 2. Time Zone Practice (page 13) <u>HOMEWORK:</u> Absolute and Relative Location Screen-cast-o-matic

Day 5	Day 6	Day 7	Day 8	Day 9
Learning Target: I can… use absolute and relative location to define landmarks. 1. Absolute and Relative Location Practice (packet pages 18-19) <u>HOMEWORK:</u> 1. Types of Maps PowerPoint/Notes 2. Continents and Oceans (pages 14-15)	Learning Target: I can… create a political map using TODALS. 1. Continents and Oceans review 2.Political Map Practice (page 16) – FORMATIVE ASSESSMENT	Learning Target: I can… create a physical map using TODALS. 1. Physical Map Practice (packet page 17) – FORMATIVE ASSESSMENT	1. Review Day * Finish Missing Work *Work on Study Guides * Class Review	1. Geography Test – SUMMATIVE ASSESSMENT

Appendix B

Name_____ Hour _____

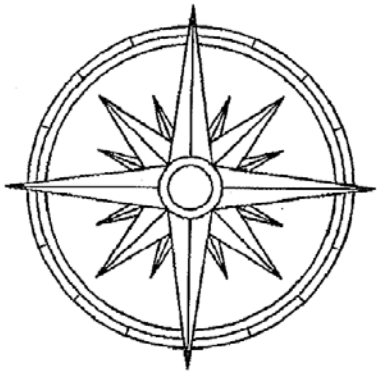
Geography Packet

1. Names of directions

   Cardinal directions: examples _____, _____, _____, _____

   Intermediate directions: examples _____, _____, _____, _____

2. Compass Rose: label it.



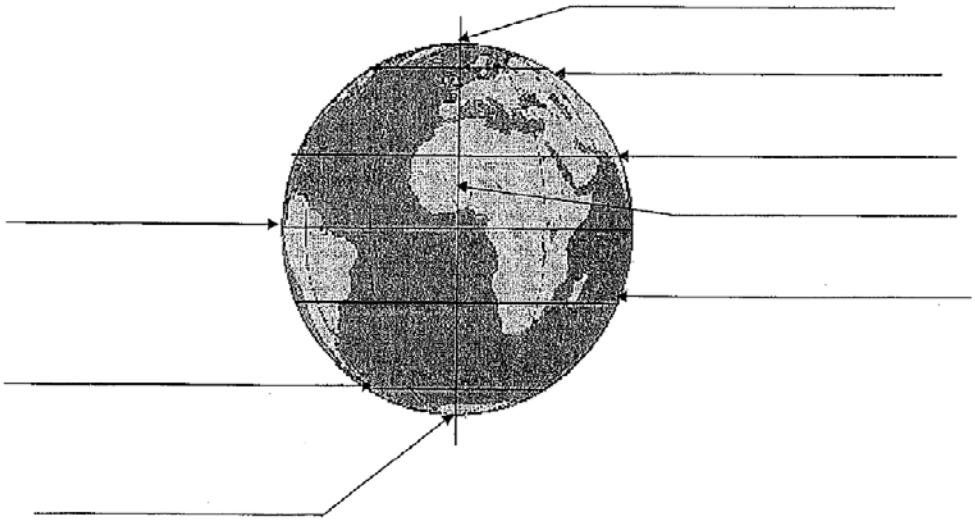
Copy a fun sentence to help you remember the cardinal directions here.

pg. 1

Special Grid Lines

Locate and label the special grid lines listed below onto the appropriate locations.

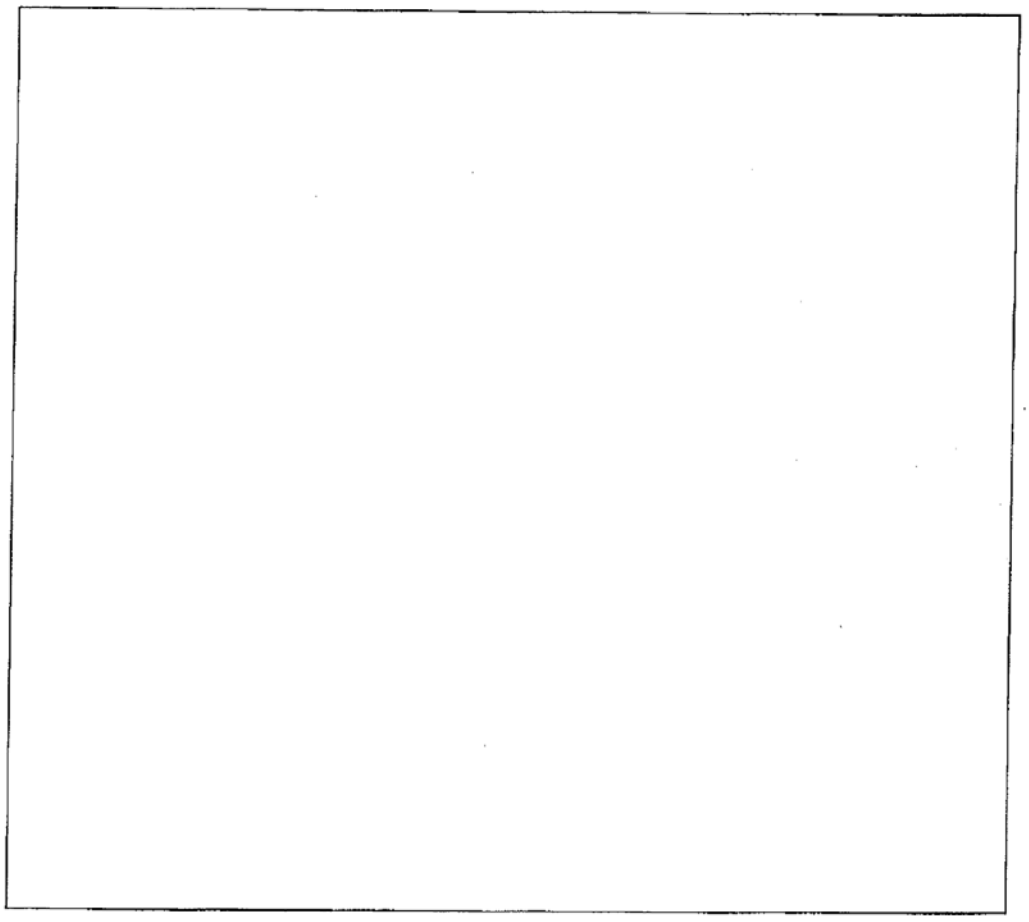
Equator	North Pole	Tropic of Capricorn	Tropic of Cancer
South Pole	Arctic Circle	Antarctic Circle	Prime Meridian



pg. 2

Follow the steps below to map the following items:

1. Draw a house in the middle of the box.
2. Draw a pond that is Southwest from the house.
3. Draw a tree to the North of the house
4. Draw a group of birds flying to the West of the tree.
5. Draw a person to the East of the pond.
6. Draw a flower garden to the East of the house.
7. Draw a bench to the north of the pond.



Pg. 4

Use the map of Texas (and your knowledge of TODALS) to answer the questions (on back) ➪

pg. 5

T: _____

O: Circle the orientation. Where can it be found? _____

D: _____

A: _____

L: Star the legend

S: Circle the scale.

Answer the following questions using the map.

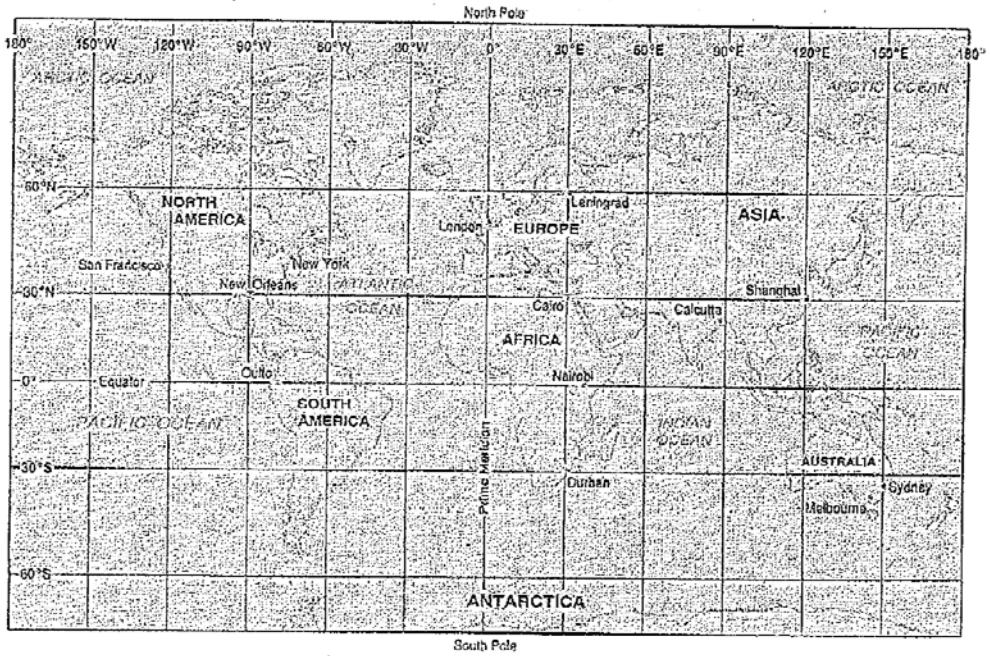
1. Name one major city in East Texas. _____
2. Name the city that is furthest west in Texas. _____
3. Waco is _____ (S,E,N,W) of Fort Worth.
4. Oklahoma is _____ (S,E,N,W) of Texas.
5. The Gulf of Mexico is _____ (S,E,N,W) of Texas.
6. Corpus Christi is _____ (S,E,N,W) of Waco.
7. What is the capital of Texas? _____
8. Approximately how many miles is it (as the crow files) from Austin to Houston? _____

Name_____ Date_____ Period_____

Special Grid Lines Pratice

Use the map to answer the following questions about latitude and longitude.

World Latitude and Longitude



1. What ocean does the Prime Meridian cross the equator?
   a. Atlantic b. Pacific c. Indian d. Artic

2. What two continents does the equator cross?
   a. North America and South America
   b. Africa and South America
   c. Africa and Europe
   d. Australia

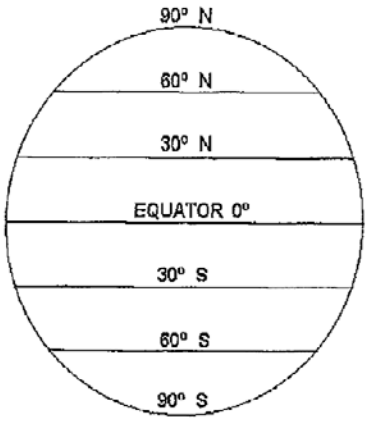
3. Which one of these continents lies completely in the Southern Hemisphere?
   a. North America
   b. Asia
   c. South America
   d. Australia

4. What ocean lies completely in the Eastern Hemisphere?
   a. Atlantic b. Indian c. Pacific d. Artic

5. What continent lies completely north of the equator and east of the Prime Meridian?
   a. Europe b. Asia c. Africa d. North America

Pg. 6

What is Latitude?



Latitude is defined as the distance north and south of the Equator on lines called parallels. The word latitude is derived from the Latin word, "latus", meaning "wide."

There are 90 degrees of latitude from the Equator to each of the north and south poles. Latitude lines are pictured on the globe to the right. Latitude lines are parallel, that is they are the same distance apart. In fact, they are sometimes called parallels.

The Equator is 0°. It divides the earth into northern and southern halves. It is called the Equator all the way around the earth.

Positions on latitude lines above the equator are called "north" and are in the northern hemisphere. They are abbreviated "N". Miami, Florida, is nearly twenty-five degrees north of the Equator. So its latitude is written as 25° N. Positions on latitude lines below the Equator are called "south". They are abbreviated "S". They indicate the position is in the southern hemisphere.

Complete the Following

a. Lines of latitude are _____ to the Equator.

b. There are _____ degrees of latitude north and south of the Equator.

c. The Equator is ____ degrees.

d. Another name for latitude lines is _____ .

e. The Equator divides the earth into _____ equal parts.

f. Write a definition of latitude.

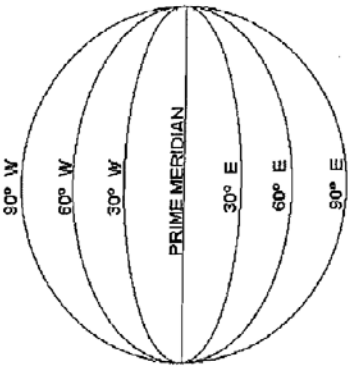
_____

_____

_____

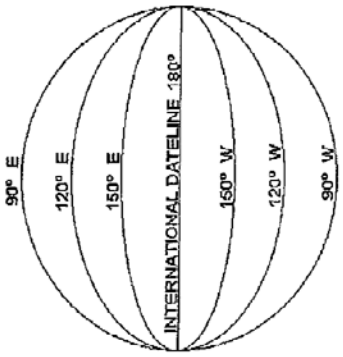
g. Draw a diagram of latitude lines

What is Longitude?



Longitude is defined as distance measured east or west of the Prime Meridian on lines called meridians. The word longitude is derived from the Latin word, "longus", meaning "length". The Prime Meridian divides the earth into western and eastern halves. It is also 0°. It passes through the city of Greenwich, England.

The Prime Meridian, as do all other lines of longitude, pass through the North and South Pole. Longitude lines are not parallel. They make the earth look like a peeled orange.



Because the earth is round like a ball, not all longitude lines are visible. There are 180 lines of longitude on the other side of the globe. On the opposite side of the Prime Meridian at 180° is the International Date Line.

Longitude lines to the left of the Prime Meridian give locations west, in the western hemisphere. Longitude lines to the right of the Prime Meridian give locations east, in the eastern hemisphere. Miami, Florida, for example, is near the 80°W line of longitude. It is west of the prime meridian and is written 80°W.

Complete the Following

a. Longitude lines connect the _____ pole with the _____ pole.

b. The line of 0° longitude is called the _____.

c. Longitude lines give directions _____ and _____ of the Prime Meridian.

d. There are _____ degrees of longitude on each side of the Prime Meridian.

e. Longitude lines are not _____ like latitude lines.

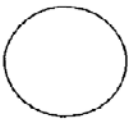
f. Write a definition of longitude.

_____

_____

_____

g. Draw a diagram of longitude lines



Adapted by Julie Spanier from Jim Cornish, Gander, Newfoundland, Canada Graphics used with permission of The Mariners' Museum http://www.mariner.org/age/index.htm

pg. 80

Using Latitude and Longitude

To find your exact location on a map, you need to determine which latitude line and which longitude line meet where you are standing. When writing locations, the **latitude is given first**. Miami, Florida then, has a location of 25° North and 80° West. This is usually written in a short form as 25° N 80° W. Give the latitude and then longitude of the shapes positioned on the grid below. Make sure you include the N, S, W, or E labels!

1. Viking Ship

_____

2. Hurricane

_____

3. Tourist

_____

4. Rafter

_____

5. Whale

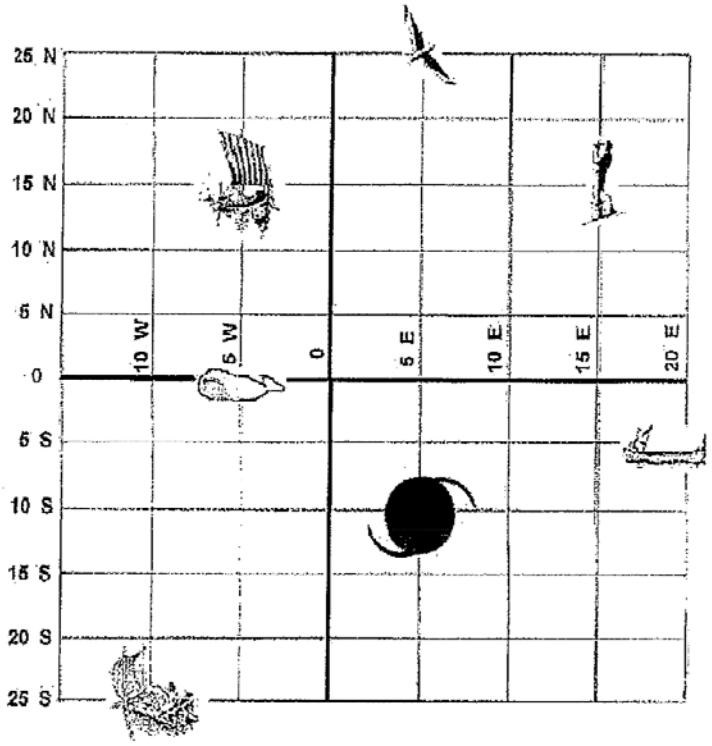
_____

6. Canoeists

_____

7. Flying Bird

_____



Adapted by Julie Spanier from Jim Cornish, Gander, Newfoundland, Canada
Graphics used with permission of The Mariners' Museum
http://www.mariner.org/age/index.htm

pg. 9

Use your atlas to find the following:

CONTINTENTS!

First locate whether you are going to be north or south of the Equator.

Second determine whether you will be East or West of the Prime Meridian.

Now use the closet numbers for latitude and longitude to that area in your atlas. Notice there are numbers on the top, bottom, left, or right.

1. 30° North 110° West _____
2. 30° South 120° East _____
3. O° 30° East _____
4. 15° South 60° West _____

COUNTRIES!

Now let's take this a step further. Locate the **country**. **You will need to refer to TWO maps to get this information.** First go to a world map to find the general area. Then find the page in your atlas that gives you more detail for that area and find the coordinates again.

1. 40°N 105°W _____
2. 60°N 75°E _____
3. 10°S 60°W _____
4. 30° S 135°E _____
5. 80°N 45° W _____
6. 10°N 30°E _____
7. 20°N 105°W _____
8. 40°N 30°E _____

CITY AND COUNTRY!

Ok now let's make it more challenging. Find **both** the **city and the country**.

Again you will need to use TWO maps and go through the process twice to get the correct answer.

	City	Country
1. 4°S 141°E	_____,	_____
2. 1°N 25°E	_____,	_____
3. 48°N 108°E	_____,	_____
4. 2°S 48°W	_____,	_____
5. 32°N 20°E	_____,	_____
6. 12°S 131° E	_____,	_____
7. 23°N 73°E	_____,	_____
8. 8. 44°N 46°E	_____,	_____

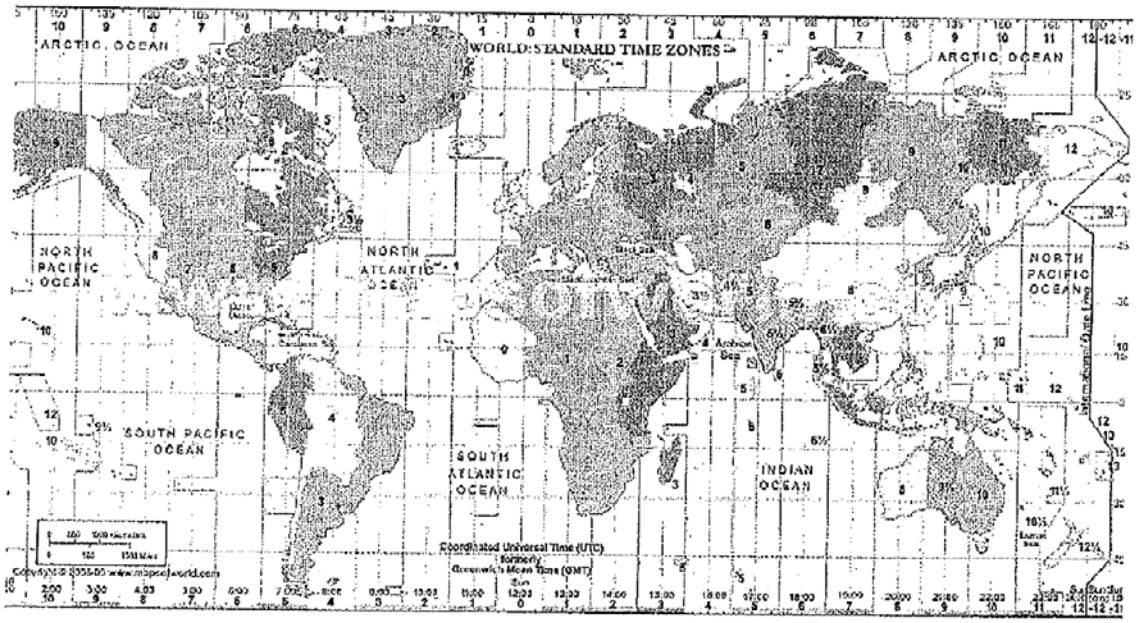
Time Zones

Time Zones are based on the lines of longitude, or meridians. There are 24 time zones in the world. The word meridian means midday. Ante-meridian, or A.M. means before midday or before noon. Post-meridian, or P.M. means after noon or after the sun has crossed the meridian for the day.

The Prime Meridian, in Greenwich England is the starting point for the world's time zones. There are 12 times zones on each side of the Prime Meridian, where these meet there is an imaginary line called the International Date Line. Each time zone covers 15° of longitude.

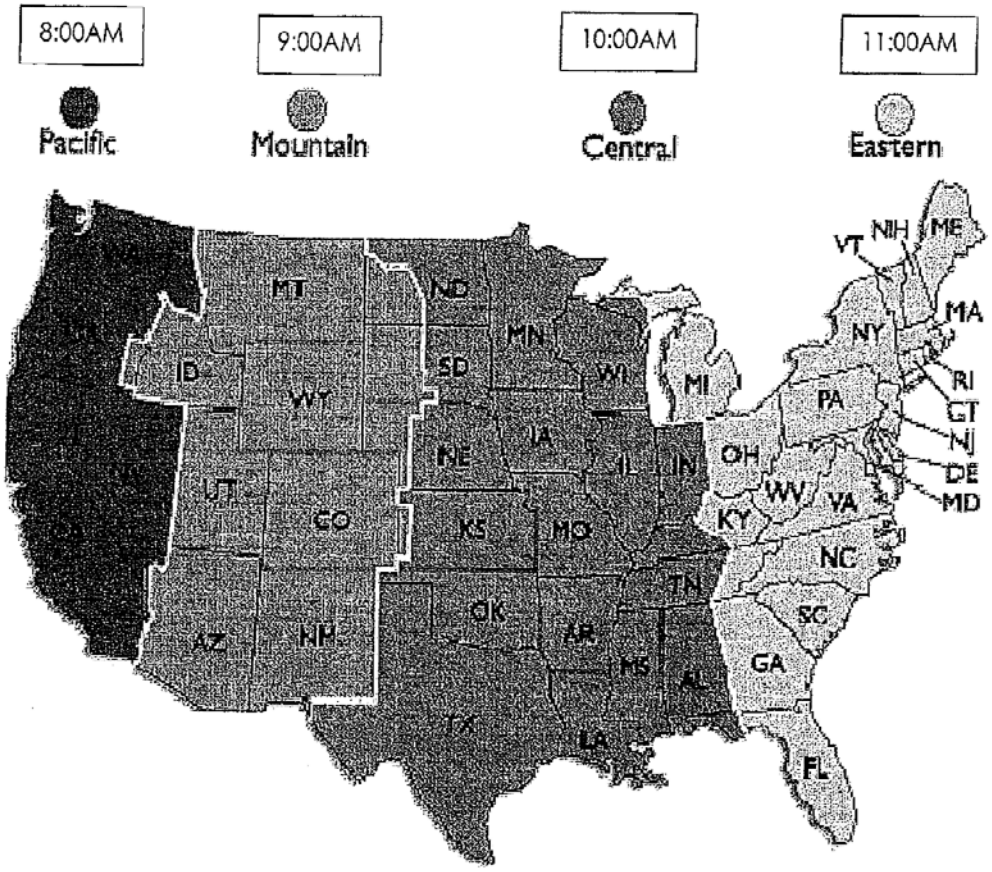
The USA does not follow the meridians closely because time zone boundaries have been shifted to run railroad schedules and to make transportation and business transactions easier.

In addition, the clock is generally shifted one hour forward between April and October. This "**daylight saving time**" allow people to take advantage of earlier sunrises, without shifting their working hours. By rising earlier and retiring sooner, you make better use of the sunlight of the early morning, and you can enjoy sunlight one hour longer in late afternoon.



pg. 12

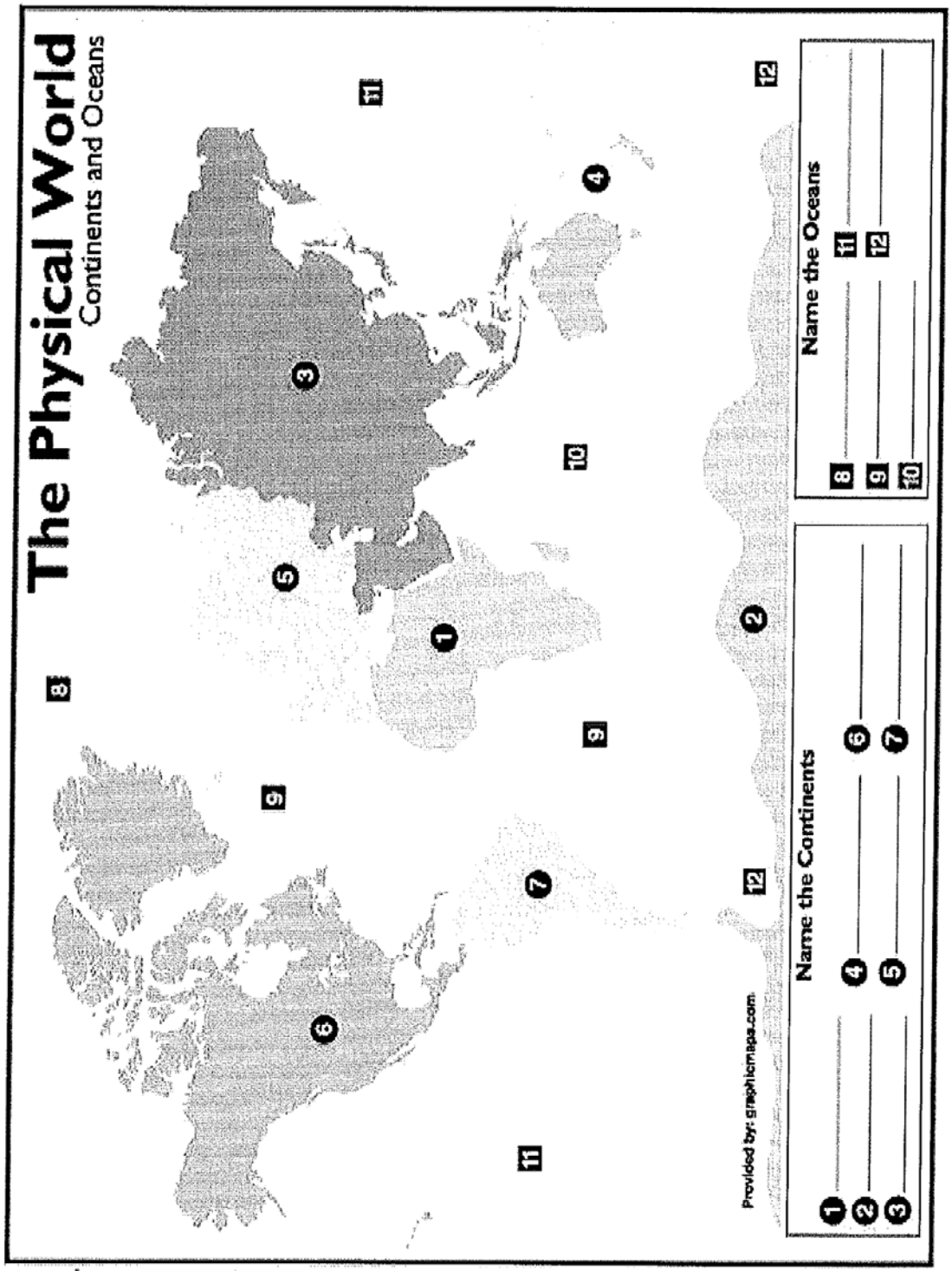
The time zones in the USA are Eastern, Central, Mountain, Pacific, Alaska, and Hawaii-Aleutian.



1. Which time zone (name) is CA in?_____
2. Which time zone (name) is IL? _____
3. Which time zone (name) is FL in?_____
4. Which time zone (name) is MN in ? _____
5. If it is 10:00am in CA, what time is it in WY? _____
6. If it is 5:00pm in MN, what time is it in UT? _____
7. If it is 11:00am in PA, what time is it in OK? _____
8. If it is 9:00am in KS, what time is it in NC? _____

pg. 13

Label the continents and oceans.



pg.14

Label the continents and oceans.

Answer the following questions using the map.

LOCATION

1. What continent is west of Asia?

2. What ocean is northeast of North America?

3. Africa is south of what continent?

4. South America is west of what ocean?

5. Australia is southeast of what continent?

6. The Atlantic Ocean is east of what continent?

TODALS

7. What is the title of the map?

8. Add orientation to the map.

9. Add a date to the map.

10. Who is the author of this map?

pg.15

Political Map Making Direction

1. States and Capitals- If you cannot fit the name in the state borders make it clear where it needs to go.
    a. Label each state name
    b. Label each state capital
    c. Mark each state capital with a symbol representing capitals

2. TODALS
    a. Title- Create an appropriate title for the map
    b. Orientation- create a compass
    c. Date- include the date you made the map
    d. Author- your name on the map
    e. Legend- what do your symbols mean

3. Color the states different colors so the borders between states are easily seen. Ex- MN cannot have the same color as Wisconsin, Iowa, North Dakota or South Dakota.

	4	3	2	1	0
States	50 states are on the map in the correct place	40-48 states are on the map in the correct place	30-39 states are on the map in the correct place	20-29 states are on the map in the correct place	Not enough data
Capitals	50 Capitals are on the map in the correct states	40-48 capitals are on the map in the correct state	30-39 capitals are on the map in the correct state	20-29 capitals are on the map in the correct state	Not enough data
TODAL- you may skip scale	5 parts of TODAL are on the map	4 parts of TODAL are on the map	2-3 parts of TODAL are on the map	1 parts of TODAL are on the map	TODAL parts not listed
Color	All states are colored and there is no overlap	40-48 states are colored correctly	30-39 states are colored correctly	20-29 states are colored correctly	Not enough data

pg. 16

Physical Map of the United States

1. Using the list below, create a physical map of the United States. Items to include:

Mountains (5)	Islands (1)	Water Features (15)
Appalachian Mountains Cascade Range Coast Range Rocky Mountains Sierra Nevada	Hawaiian Islands	Atlantic Ocean Colorado River Columbia River Gulf of Mexico Lake Erie Lake Huron Lake Michigan Lake Superior Lake Ontario Mississippi River Missouri River Ohio River Pacific Ocean Rio Grande River Yukon River

2. Include TODALS. You may Skip Scale

Use the following codes/colors for your legend

Mountains = your choice

Islands = your choice

Water = blue

** Do NOT SPELL the color names in your legend!

	4	3	2	1	0
TODALS	5 parts of TODAL are included	4 parts of TODAL are included	2-3 parts of TODAL are included	1 part of TODAL are included	No parts of TODALS
Physical Features	All 21 physical features are labeled correctly	16-20 physical features are labeled correctly	8-15 physical features are labeled correctly	1-7 physical features are labeled correctly	0 physical features are labeled correctly
Colors	All 21 physical features are correctly colored	16-20 physical features are labeled colored	8-15 physical features are labeled colored	1-7 physical features are labeled colored	0 physical features are labeled colored

pg. 17

Name _____ Hour _____

ABSOLUTE and RELATIVE Location PRACTICE

You will need to find the absolute location and relative location of *3 countries you would like to visit, ANYWHERE in the world!*

- Fill in the names of the three countries.
- Find the absolute location (latitude and longitude) of each of your 3 countries. I understand this will be an approximate number.
- Add the relative location for each place, what is it close to? Use other countries, landmasses, oceans, etc.

1. _____
   a. Absolute Location: _____
   b. Relative Location: _____
   _____
   _____

2. _____
   a. Absolute Location: _____
   b. Relative Location: _____
   _____
   _____

3. _____
   a. Absolute Location: _____
   b. Relative Location: _____
   _____
   _____

pg. 18

pg. 19

CHALLENGE!

1. Add your 3 locations to the blank map below.

2. Draw in the lines of latitude and longitude that you used to find the absolute location.
Remember that lines of longitude curve!

3. Label places you used to describe the relative location.